

REMARKS

Claims 1-22 are pending in the present application. Reconsideration of the claims is respectfully requested.

I. Examiner Interview

Applicants thank Examiner Vu for the courtesies extended to Applicants representative during the April 20, 2004 telephone interview. During the interview, Examiner Vu appeared to indicate that the present claims overcome the prior art pending an update search and consultation with the Primary Examiner. The substance of the interview is summarized in the remarks of Section II, which follows.

II. 35 U.S.C. § 102, Alleged Anticipation, Claims 1-4, 8-10, 15 and 18-21

The Office Action rejects claims 1-4, 8-10, 15 and 18-21 under 35 U.S.C. § 102(b) as being allegedly anticipated by Brown et al. (U.S. Patent No. 6,075,772). This rejection is respectfully traversed.

As to claim 1, the Office Action states:

Brown teaches a method for enhancing performance of a bus in a data processing system, comprising: monitoring data flow through an adapter coupled to the bus in a data processing system (counting data flow through the adapter) (col. 6, lines 5-10); determining if increased bus performance is desirable (checking to see if the request is for a guarantee bandwidth connection) (col. 9, lines 11-18); and handling of control to a code module (DLC 20) which enhances the performance of the bus if increased bus performance is desirable (giving the adapter information and control to DLC 20) (col. 7, lines 7-37 and Figs 3-4).

Office Action dated January 28, 2004, pages 2-3.

Claim 1 reads as follows:

1. A method for enhancing performance of a bus in a data processing system, comprising:
 - monitoring data flow through an adapter coupled to the bus in a data processing system;
 - determining if increased bus performance is desirable; and

handing off control to a code module which enhances the performance of the bus if increased bus performance is desirable.

A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. In re Bond, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990). All limitations of the claimed invention must be considered when determining patentability. In re Lowry, 32 F.3d 1579, 1582, 32 U.S.P.Q.2d 1031, 1034 (Fed. Cir. 1994). Anticipation focuses on whether a claim reads on the product or process a prior art reference discloses, not on what the reference broadly teaches. Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983). Applicants respectfully submit that Brown does not identically show each and every claim feature as they are arranged in the claims. Specifically, Brown does not teach monitoring data flow through an adapter coupled to the bus in a data processing system, determining if increased bus performance is desirable, and handing off control to a code module which enhances the performance of the bus if increased bus performance is desirable.

Brown is directed to a method that controls the data rate through a communications adapter having a guaranteed bandwidth connection. The data rate is controlled by assigning to the guaranteed bandwidth connection, a maximum threshold value proportional to the amount of data to be transmitted through the communications adapter in a time interval to satisfy the guaranteed bandwidth of the connection. The amount of data transmitted through the communications adapter for the guaranteed bandwidth connection is then counted so as to provide a connection data count associated with the guaranteed bandwidth.

Nowhere, in any section of Brown, is an adapter coupled to a bus through which data flow is monitored. The Office Action alleges that this feature is taught at column 6, lines 5-10, which reads as follows:

FIG. 1 also illustrates maximum data counters 22a and 22b. The counters 22a and 22b are associated with guaranteed bandwidth connections using the DLC layer 20 and count the amount of data in a given interval of time which is transmitted to the adapter 30 for a guaranteed bandwidth connection.

In this section, Brown is describing that an adapter is connected to the DLC layer of the computer. The Dynamic Link Control layer is not a bus. The DLC layer is defined as the layer where data packets are encoded and decoded into bits. The DLC layer furnishes transmission protocol knowledge and management and handles errors in the physical layer, flow control and frame synchronization. In contradistinction, a bus is a hardware device defined as one of the sets of conductors connecting the various functional units in a computer. Thus, Brown does not teach an adapter coupled to a bus through which data flow is monitored. Moreover, nowhere in the Brown reference is a bus even mentioned.

Furthermore, Brown does not teach determining if increased bus performance is desirable. The Office Action alleges that this feature is taught at column 9, lines 11-18, which reads as follows:

FIG. 4 illustrates the operations of an adapter 30 according to the present invention. As seen in FIG. 4, when a request for a connection is received by adapter 30, the adapter checks to see if the request is for a guaranteed bandwidth connection (block 50). If the request is not for a guaranteed bandwidth connection, then the request is processed as a standard best efforts connection and the connection is established (block 60).

In this section, Brown is merely describing that the adapter, which is connected to the DLC layer, is monitoring a connection request to see if the request is for a guaranteed bandwidth connection. In addition to the adapter not being coupled to a bus, the adapter is not monitoring data flow of the bus nor is it determining if increased bus performance is desirable. The adapter of Brown is merely determining if a communications connection should be of guaranteed bandwidth or not.

Still further, Brown does not teach handing off control to a code module which enhances the performance of the bus if increased bus performance is desirable. The Office Action alleges that this feature is taught at column 7, lines 7-37, which reads as follows:

Operation of one embodiment of the present invention will now be described with respect to FIG. 3, which illustrated the operations of the DLC layer 20 of FIG. 1. As seen in FIG. 3, the DLC layer 20 obtains adapter information (block 58 of FIG. 4) for the adapter 30 (block 70). In the OSA adapter example, when a data processing system is established as a user of OSA a signal called Activate SAP is sent to the adapter. On the reply to this request OSA provides the OSA transmit capacity and the total

OSA capacity. This information may then be utilized as discussed below to establish the appropriate thresholds.

The adapter information, along with information on the time to transmit data to the adapter is then used to determine a timer value T which establishes a predefined time interval and a maximum data count for each guaranteed bandwidth connection N_i where i is the i^{th} guaranteed bandwidth connection (block 72). The maximum data count N_i acts as a maximum threshold value. N_i and T values are preferably selected based upon the amount of buffers allocated to the connection, the time to transmit data to the adapter and the service time for the data once it has reached the adapter. The interval T and the maximum data count N_i are preferably selected so that the average queue length in the adapter (the amount of buffers used for the connection) does not exceed a specified percentage of the available buffers. Preferably, the same T values is utilized for each guaranteed bandwidth connection of an adapter. Furthermore, the value of T may be predefined in both the adapter 30 and the DLC layer 20. However, in such a case the flexibility to handle various adapters with differing amounts of memory may be reduced.

In this section, Brown is merely describing the process for the guaranteed bandwidth connection through the DLC layer. As shown above, the DLC layer is not a bus and monitoring a communication connection is not equivalent to monitoring the data flow of the bus. Additionally, nowhere in this section, or any other section of Brown, is enhancing the performance of the bus taught. Brown also fails to teach handing off control to a code module which enhances the performance of the bus if increased bus performance is desirable.

Independent claims 9 and 15 recite similar features in their respective claim terminology. Claim 9 recites "at least one input/output (I/O) adapter coupled to the first bus." Claim 15 recites "a performance optimizer unit and a hardware bus control unit coupled to the performance optimizer unit." As shown above, the adapter of Brown is connected through the DLC layer and not the physical layer where the bus resides.

Thus, Brown does not teach each and every feature of independent claims 1, 9 and 15 as is required under 35 U.S.C. § 102. At least by virtue of their dependency on independent claims 1, 9 and 15, respectively, Brown does not teach each and every feature of dependent claims 2-4, 8, 10 and 18-21. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 1-4, 8-10, 15 and 18-21 under 35 U.S.C. § 102.

Furthermore, Brown does not teach, suggest, or give any incentive to make the needed changes to reach the presently claimed invention. Absent the Examiner pointing out some teaching or incentive to implement Brown such that, an adapter is coupled to the bus in a data processing system through which data flow is monitored, determining if increased bus performance is desirable, and handing off control to a code module which enhances the performance of the bus if increased bus performance is desirable, one of ordinary skill in the art would not be led to modify Brown to reach the present invention when the reference is examined as a whole. Absent some teaching, suggestion, or incentive to modify Brown in this manner, the presently claimed invention can be reached only through an improper use of hindsight using the Applicants' disclosure as a template to make the necessary changes to reach the claimed invention.

Moreover, in addition to their dependency from independent claims 1, 9 and 15, respectively, Brown does not teach the specific features recited in dependent claims 2-4, 8, 10 and 18-21. For example, with regard to claim 3, Brown does not teach changing, in small incremental steps, hardware settings upstream to the adapter; and after an optimum performance point is achieved, maintaining current state. The Office Action alleges that these features are taught at column 8, lines 3-6, and column 8, line 48 to column 9, line 3, which read as follows:

If the guaranteed bandwidth connection was incorrectly utilized for the previous interval, then the DLC layer 20 may compensate for the incorrect utilization of the connection by modifying the value of N_i for the next interval (block 88).

Column 8, lines 3-6.

As will be appreciated by those of skill in the art, the present invention provides for packets of data to be transmitted to the communications adapter 30 by the DLC layer 20. These packets of data are typically in a predefined size for a given connection. The fixed size nature of the data packets results in the possibility that the maximum data count may not fall on a packet boundary. For example, to a guaranteed bandwidth connection is a 1.5 Mb/sec. connection and the interval is 0.1 seconds, then the present invention would 150 Kb per interval to be transmitted for the connection. However, if the packet size is 4 Kb then the count will reach 148 Kb and the next packet will cause the maximum count to be exceeded. Preferably, the additional packet will not be sent to the adapter and the count will not be exceeded. However, if the additional packet is accepted and the count exceeded, on the next interval, the

starting count for the connection will be adjusted to reflect the over-utilization of the connection on the previous interval and the start count could be set to 2 Kb to compensate for the additional data of the previous interval. Alternatively, the maximum threshold could be set to 148 Kb to compensate for the additional 2 Kb transmitted during the previous interval.

Column 8, lines 48 to column 9, line 3. In these sections, Brown is merely describing changes made in the DLC layer. As shown above, the DLC layer is a software layer and any changes made in this layer are changes to software settings. In contradistinction, the claims recite changing, in small incremental steps, hardware settings upstream to the adapter; and after an optimum performance point is achieved, maintaining a current state.

As an additional example, with regard to claim 4, Brown does not teach determining whether the performance is a function of an external device connected to the adapter. The Office Action alleges that this feature is taught at column 8, lines 46-67, shown above. In this section, Brown is monitoring the throughput of an adapter; there is nothing in this section, or any other section of Brown, that teaches determining whether the performance is a function of an external device connected to the adapter.

As a further example, with regard to claims 10 and 18-21, Brown does not teach a bus connected to an adapter or is a bus even mentioned, as shown above. Thus, Brown does not teach a second bus disposed to be monitored by the bus monitor, and connected to the at least one input/output (I/O) adapter, as recited in claim 10. Nor does Brown teach "determining whether bus performance is maximized", as recited in claim 18; "passing at least one parameter to the hardware bus control unit", as recited in claim 19; "a hardware bus control unit reading bus performance", as recited in claim 20; and, "changing at least one bus parameter in an I/O adapter", as recited in claim 21.

Therefore, in addition to being dependent on independent claims 1, 9 and 15, respectively, dependent claims 2-4, 8, 10 and 18-21 are also distinguishable over Brown by virtue of the specific features recited in these claims. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 2-4, 8, 10 and 18-21 under 35 U.S.C. § 102.

III. 35 U.S.C. § 103, Alleged Obviousness, Claims 5, 11-13 and 16-17

The Office Action rejects claims 5, 11-13 and 16-17 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Brown et al. (U.S. Patent No. 6,075,772) and further in view of Jeddelloh (U.S. Patent No. 6,363,445 B1). This rejection is respectfully traversed.

Claims 5, 11-13 and 16-17 are dependent on independent claims 1, 9 and 15 and, thus, these claims distinguish over Brown for at least the reasons noted above with regards to claims 1, 9 and 15. Moreover, Jeddelloh does not provide for the deficiencies of Brown and, thus, any alleged combination of Brown and Jeddelloh would not be sufficient to reject independent claims 1, 9 and 15 or claims 5, 11-13 and 16-17 by virtue of their dependency. That is, Jeddelloh does not teach monitoring data flow through an adapter coupled to the bus in a data processing system, determining if increased bus performance is desirable, and handing off control to a code module which enhances the performance of the bus if increased bus performance is desirable.

Moreover, the Office Action may not use the claimed invention as an "instruction manual" or "template" to piece together the teachings of the prior art so that the invention is rendered obvious. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). Such reliance is an impermissible use of hindsight with the benefit of Applicant's disclosure. *Id.* Therefore, absent some teaching, suggestion, or incentive in the prior art, Brown and Jeddelloh cannot be properly combined to form the claimed invention. As a result, absent any teaching, suggestion, or incentive from the prior art to make the proposed combination, the presently claimed invention can be reached only through an impermissible use of hindsight with the benefit of Applicant's disclosure a model for the needed changes.

In view of the above, Brown and Jeddelloh, taken either alone or in combination, fail to teach or suggest the specific features recited in independent claims 1, 9 and 15, from which claims 5, 11-13 and 16-17 depend. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 5, 11-13 and 16-17 under 35 U.S.C. § 103.

IV. 35 U.S.C. § 103, Alleged Obviousness, Claims 6 and 7

The Office Action rejects claims 6 and 7 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Brown et al. (U.S. Patent No. 6,075,772) and further in view of Harper et al. (U.S. Patent No. 5,481,755). This rejection is respectfully traversed.

Claims 6 and 7 are dependent on independent claim 1 and, thus, these claims distinguish over Brown for at least the reasons noted above with regards to claim 1. Moreover, Harper does not provide for the deficiencies of Brown and, thus, any alleged combination of Brown and Harper would not be sufficient to reject independent claim 1 or claims 6 and 7 by virtue of their dependency. That is, Harper does not teach monitoring data flow through an adapter coupled to the bus in a data processing system, determining if increased bus performance is desirable, and handing off control to a code module which enhances the performance of the bus if increased bus performance is desirable.

Moreover, the Office Action may not use the claimed invention as an "instruction manual" or "template" to piece together the teachings of the prior art so that the invention is rendered obvious. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). Such reliance is an impermissible use of hindsight with the benefit of Applicant's disclosure. *Id.* Therefore, absent some teaching, suggestion, or incentive in the prior art, Brown and Harper cannot be properly combined to form the claimed invention. As a result, absent any teaching, suggestion, or incentive from the prior art to make the proposed combination, the presently claimed invention can be reached only through an impermissible use of hindsight with the benefit of Applicant's disclosure a model for the needed changes.

In view of the above, Brown and Harper, taken either alone or in combination, fail to teach or suggest the specific features recited in independent claim 1, from which claims 6 and 7 depend. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 6 and 7 under 35 U.S.C. § 103.

V. 35 U.S.C. § 103, Alleged Obviousness, Claims 14 and 22

The Office Action rejects claims 14 and 22 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Brown et al. (U.S. Patent No. 6,075,772) and further in view of Burns et al. (U.S. Patent No. 6,134,624). This rejection is respectfully traversed.

Claims 14 and 22 are dependent on independent claims 9 and 15 and, thus, these claims distinguish over Brown for at least the reasons noted above with regards to claims 9 and 15. Moreover, Burns does not provide for the deficiencies of Brown and, thus, any alleged combination of Brown and Burns would not be sufficient to reject independent claims 9 and 15 or claims 14 and 22 by virtue of their dependency. That is, Burns does not teach "at least one input/output (I/O) adapter coupled to the first bus", as recited in claim 9 and "a performance optimizer unit and a hardware bus control unit coupled to the performance optimizer unit", as recited in claim 15.

Moreover, the Office Action may not use the claimed invention as an "instruction manual" or "template" to piece together the teachings of the prior art so that the invention is rendered obvious. *In re Fritch*, 972 F.2d 1260, 23 U.S.P.Q.2d 1780 (Fed. Cir. 1992). Such reliance is an impermissible use of hindsight with the benefit of Applicant's disclosure. *Id.* Therefore, absent some teaching, suggestion, or incentive in the prior art, Brown and Burns cannot be properly combined to form the claimed invention. As a result, absent any teaching, suggestion, or incentive from the prior art to make the proposed combination, the presently claimed invention can be reached only through an impermissible use of hindsight with the benefit of Applicant's disclosure a model for the needed changes.

In view of the above, Brown and Burns, taken either alone or in combination, fail to teach or suggest the specific features recited in independent claims 9 and 15, from which claims 14 and 22 depend. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 14 and 22 under 35 U.S.C. § 103.

VI. Conclusion

It is respectfully urged that the subject application is patentable over the prior art of record and is now in condition for allowance. The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

Respectfully submitted,

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